

Indoor air quality and its association with respiratory health among preschool children in urban and suburban area

ABSTRACT

Indoor air quality (IAQ) has become a major concern nowadays because of the universality of exposure and its potential negative impact on human health especially on children. This study is intended to explore the association between IAQ and the respiratory health among preschool children in urban and suburban area. A cross-sectional comparative study was carried out among Malay preschool children in urban (N= 60, Puchong) and suburban (N=60, Hulu Langat) areas. An indoor air quality assessment was conducted in 12 preschools and 60 houses which include parameters of PM_{2.5}, PM₁₀, VOCs, mold, bacteria, Gram-negative bacteria and physical parameters. A set of standardized questionnaire was distributed to obtain respondents' background information, exposure history and respiratory health symptoms. Spirometry test was carried out and the data obtained were analyzed to determine the lung function of the respondents. There was a significant difference between IAQ in urban and suburban preschools for all parameters measured ($p < 0.05$). Most of the pollutants were significantly associated with respiratory health symptoms. There was a significant association between the level of indoor pollutants with the lung function abnormalities among the respondents. Even though this study is the first to take Gram-negative bacteria as an indoor air pollutant, the finding also shows that there is a significant association between exposure of Gram-negative bacteria with lung function impairment and higher reported respiratory symptoms among the respondents. The finding concluded that exposures to indoor air pollutants, especially PM_{2.5} increases the risk of getting lung function abnormality and respiratory health symptoms among respondents.

Keyword: Indoor air quality; Mold; Bacteria; Lung function; Respiratory health symptoms